REMARKS

The application now contains claims 1-10, 12-27 and 29-35. Claims 2 and 10 are amended. Claim 2 was amended in order to correct a typographical error in the claim. It appears from the Examiner's action that the amendment of July 19, 2004 and was mentioned in Response after final filed on August 2, 2004 was not considered by the Examiner, since the claims listed by the Examiner include claim 28 which was cancelled in that amendment. While the amendment was an unentered amendment after final, applicants respectfully submit it should have been entered once the case was reopened by the Examiner.

Claims 1, 6-11, 13, 14 and 18 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hudson. Claims 2, 12, 16 17 and 19-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hasagawa in view of Hudson. Claims 3-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hudson in view of Muehllehner. Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Hudson in view of Reitan. Claims 22-35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hudson in view of Hasagawa in view of Shimoni. Applicants respectfully traverse these rejections. Furthermore, applicants submit that the rejections do not provide a *prima facie* case of anticipation or obviousness for any of the claims other than, arguably, claim 10.

In summary, all of the claims are rejected based on Hudson alone or Hudson together with one or more additional references. In view of the fact that all of the claims are so rejected and Hudson is deficient in at least one element ascribed to it by the Examiner, applicants at this time are only arguing the independent claims. The dependent claims are patentable for at least the reasons that their parents are patentable.

As to claim 1, the Examiner relies on Hudson to teach that the weight of each of the individual radiation elements is *separately* distributed along the line of flight. The Examiner apparently reads the paragraph bridging pages 601 and 602 to indicate that the events are *separately* distributed. Applicants strongly disagree with the Examiner's position. In fact, Hudson in the final two lines of page 601 clearly states that the events are "binned". Once the events are binned, their individual identity is destroyed, such that it is impossible to separately distribute their weights. Furthermore, Hudson in the first paragraph of Section IV on page 606 that as the number of subsets is reduced the noise increases. The simulation study example (page 604, line 6) also clears shows binning.

Thus claim 1 (and the claims dependent on claim 1) which require separate distribution of the weights of individual radiation events are not *prima facie* anticipated or obvious.

Claim 10 is an independent claim in which an EM method is applied to the data in sub-sets *which are formed based on the time of acquisition of the events.* The Examiner again relies on Hudson to provide this feature, citing Section II. Applicants submit that Hudson does not teach this feature in Section II and thus does not provide a *prima facie* basis for the rejection of claim 10 as being anticipated and for its dependent claims as being anticipated or obvious.

Hudson clearly teaches that the subsets are *ordered* subsets, i.e., subsets that are based on some geometric grouping. This is clarified in Section III, which further teaches that "Since PET collects all tube counts simultaneously, ordered subset EM can best be applied after full collection of counts." At this point (since the counts are binned and lose their individual identity) it is *impossible* to provide subsets according to time of acquisition.

Applicants do note, that the second full paragraph on page 608, while still requiring ordered subsets, might (but it is not clear) also include performing the EM reconstruction based on ordered subsets that are segmented further by time. To avoid this possible conflict, applicants have amended claim 10 to include the limitation of claim 11, i.e., that the subsets include data having less than 180 degree view angle. Applicants submit that old claim 11 was not *prima facie* obvious.

The Examiner claims that Hudson teaches the feature that the subsets have less than 180 degree view. The Examiner bases this on the fact that the three detectors are separated by 120 degrees. However, this separation assures that data is acquired simultaneously from three directions (more than 180 degrees). It is noted that this same paragraph describes that the subsets contain three or six projections and that the subsets should be derived in a "balanced" way. This can only mean that each subset has three views spaced by 120 degrees (a total view angle of 180 degrees) or six view angle spaced at 60 degrees. In either case the limitation of old claim 11 is not taught.

The rejection of claim 22 under 35 U.S.C. §103(a) as being unpatentable over Hudson, in view of Hasagawa in view of Shimoni, is respectfully traversed. Applicants submit that the Examiner has not provided a *prima facie* case of obviousness.

As a preliminary matter, the Examiner has apparently misunderstood Shimoni. Shimoni describes the use of rebinned and unrebinned data. However, all of the data in Shimoni is initially binned when acquired. If the Examiner were correct that Shimoni uses unbinned data, then the specification should have discussed unbinned data. However, it does not discuss such unbinned

data, it only discusses data that has been *re*binned and data that has not been *re*binned, clearly implying that the data was all initially binned.

Furthermore, it is noted that the Shimoni reference is in the field of X-Ray based CT. As applicants have previously pointed out X-Ray CT operates in a high count rate regime. In a high count rate regime it would not appear to be desirable, or even possible, to operate on unbinned data, since this would require the use separate recording of untold numbers of events and separately applying them to a system of reconstruction that requires views and the like, which naturally lead to binning. The idea of using unbinned data for X-Ray CT, is not known to the applicants and the Shimoni reference does not teach doing so. In CT, events that are detected by any particular detector are always binned together. The Examiner is referred to col. 5, lines 6-21 of Shimoni for further clarification.

Since the Examiner admits (page 8, third paragraph from bottom) that Hudson and Hasagawa do not teach utilizing unbinned events, there is no *prima facie* case of obviousness of claim 22.

Claims 31 and 33 are patentable for the same reasons as claim 22.

Since claims 2, 12, 16, 17 and 19-21 were rejected as being obvious over Hasagawa in view of Hudson, where Hudson was used as the reference for the parent claims, applicants submit that whatever else these claims teach, they do not teach the separate distribution of weights of individual events or the applying the EM method to data in sub-sets formed based on the time of acquisition as required by their parent claims.

In view of the above arguments, applicants submit that the claims are patentable and that the application is in order for allowance. Notice to that effect is respectfully solicited.

Respectfully submitted,
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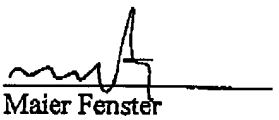

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